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File Number: T 410/90 - 3.3.3

Application No.: 84 402 402.6

Publication No.: 0 143 716

Title of invention: Process for the polymerisation and the copolymerisation of ethylene at high pressure and temperature in the presence of Ziegler-type catalysts

Classification: C08F 10/02

**D E C I S I O N**  
of 12 July 1991

Proprietor of the patent: REPSOL PETROLEO S.A.

Opponent: Dow Benelux N.V.

Headword:

EPC Articles 54, 56, 83

Keyword: "Novelty (yes)" -  
"Inventive step (yes) - embodiment providing a  
solution of the technical problem" -  
"Disclosure of the invention - common general knowledge"

Headnote



Case Number : T 410/90 - 3.3.3

**D E C I S I O N**  
of the Technical Board of Appeal - 3.3.3  
of 12 July 1991

**Appellant :** Dow Benelux N.V.  
(Opponent) Postbus 48  
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**Representative :**

**Respondent :** REPSOL PETROLEO S.A.  
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**Decision under appeal :** Decision of Opposition Division of the European  
Patent Office of 15 December 1989, issued on  
14 March 1990, rejecting the opposition filed  
against European patent No. 0 143 716 pursuant to  
Article 102(2) EPC.

**Composition of the Board :**

**Chairman :** F. Antony  
**Members :** C. Gérardin  
M. Aúz Castro

## Summary of Facts and Submissions

- I. The mention of the grant of the patent No. 0 143 716 in respect of European patent application No. 84 402 402.6 filed on 26 November 1984 (a Monday) and claiming priority of 24 November 1983 of an earlier application in Spain, was published on 11 November 1987 on the basis of five claims.

Claim 1 reads as follows:

"Procédé continu de polymérisation et copolymérisation de l'éthylène à des pressions jusqu'à 3 000 bars et à des températures supérieures à 140 °C en présence de catalyseurs contenant au moins un dérivé d'un métal de transition et un dérivé organique d'aluminium, caractérisé en ce qu'on injecte, comme désactiveur, dans le mélange en réaction, au moins, une substance inorganique échangeuse d'anions choisie parmi les carbonates, phosphates, hydroxydes et des chlorures, naturels ou synthétiques d'aluminium et d'un métal alcalin ou alcalino terreux, en quantité suffisante pour provoquer la désactivation du catalyseur, ledit désactiveur étant choisi de manière à ce que ses produits de réaction avec les constituants de catalyseur soient retenus dans le polymère."

- II. On 9 August 1988 the Opponent filed a notice of opposition by telefax, duly confirmed in writing on 10 August 1988, against the grant of the patent and requested revocation thereof for non-compliance with the requirements of Article 100(a) and (b) EPC. These objections, which were emphasised and elaborated in a later submission as well as during oral proceedings, were based essentially on the following documents:

- (1) Commercial pamphlet DHT-4A (Hydrotalcite-like Compound), Kyowa Chemical Industry Co., Ltd, Japan, 15 July 1981
- (3) FR-A-2 302 305.

III. By a decision delivered orally on 15 December 1989, with written reasons posted on 14 March 1990, the Opposition Division rejected the opposition on the grounds that the requirements of Article 100(a) and (b) were met. It was first stated in that decision that none of the documents relied upon by the Opponent disclosed explicitly or implicitly all the features of the claimed process, so that novelty was acknowledged. Further, an inventive step was involved as well, since the teachings of documents (1) and (3) could not be combined in the manner proposed by the Opponent; whereas the process described in document (3), regarded as the closest state of the art, required the incorporation of metal salts in order to deactivate the catalyst, the addition of hydrotalcite according to document (1) occurred for stabilization purposes, i.e. for further processing of polymers. Furthermore, as far as the issue under Article 100(b) EPC was concerned, the description of the patent in suit clearly specified that deactivation occurred at the end of the actual polymerization reaction.

IV. The Opponent (Appellant) thereafter lodged a notice of appeal on 11 May 1990 and paid the prescribed fee at the same time. In the Statement of Grounds of Appeal filed on 12 July 1990, wherein all the previously raised objections were maintained, the Appellant referred to the following additional documents:

- (4) Kunststoff-Handbuch, Band IV, Polyolefine, Carl Hansen Verlag München 1969, pages 79 to 85

- (5) US-A-3 318 857
- (6) FR-A-1 204 391.

The arguments presented by the Appellant can be summarised as follows:

Regarding novelty, the restrictive interpretation of document (1) by the Opposition Division could not be shared; on the contrary, that citation should be read as a skilled person would do it, who would know that deactivation of a Ziegler catalyst required a hydrogen active compound, and would immediately recognise DHT-4A as suitable for that purpose, as taught in document (4).

As far as inventive step was concerned, the objective problem over document (3) was only to find a catalyst deactivator which did not have the disadvantages associated with the use of metal salts of carboxylic acids. The solution thereto as claimed in the patent in suit was obvious in view not only of document (1), but of documents (5) and (6) as well.

The use of DHT-4A as a catalyst deactivator required particular measures, i.e. specific particle size and treatment with surface active agent, which were not disclosed in the patent in suit. It followed that the invention was not sufficiently disclosed for a person skilled in the art to carry it out.

- V. By letter received on 16 November 1990 the Patentee (Respondent) requested, under the provisions of Rule 3 EPC in its then valid version, that French be replaced by English as the language of the proceedings.

This was agreed by the Appellant on 9 January 1991.

VI. The arguments presented by the Respondent in the Counterstatement of Appeal filed on 5 March 1991 can be summarised as follows:

The teaching of document (1) was unambiguously directed to the use of DHT-4A as a stabilizer for the processing of polyolefins. Apart from the fact that the interpretation of document (1) in the light of document (4) would be inappropriate to raise an objection of lack of novelty, the latter citation was in fact not relevant at all; first, contrary to the patent in suit, it taught that the removing of catalyst residues was very important and mentioned three different methods to carry it out; secondly, in view of the date of publication of that citation, the catalysts referred to must have been of a much lower activity, thus involving other problems and corresponding to another technique.

Regarding the issue of inventive step, both newly cited documents (5) and (6) referred to obsolete processes involving the use of catalysts of the first generation, which, being used in large amounts, gave rise to considerable removal problems. By contrast, according to the present process, the reaction products of the deactivator and the constituents of the catalyst were retained in the polymer. Further, the obviousness argumentation of the Appellant on the basis of document (1) could only result from hindsight analysis.

As far as alleged insufficiency of disclosure was concerned, it was regarded as being within the ordinary skill of an expert to determine the most appropriate particle size of the deactivators. Reference was made in this respect to the decision T 14/83.

VII. During oral proceedings, which were held on 12 July 1990 the Appellant argued additionally that the difference between production of polymer as in the application in suit and stabilisation of polymer as in document (1) was mainly artificial; that was evident from document (4) which illustrated that processing started at the end of the polymerisation reaction. It followed that the use of DHT-4A in the production of polyolefins could only concern a polymer in the molten state, like in the patent in suit. Similar considerations applied to document (6), since the only difference between high efficiency catalysts and conventional catalysts was the support, which was not reflected in the wording of Claim 1 of the patent in suit.

Further, the Appellant put forward that, in view of the yield of the polymerisation reaction according to Example 1 of the patent in suit, the catalyst efficiency could not be regarded as acceptable at low pressures and that, consequently, that embodiment did not provide a solution to the problem underlying the patent in suit.

The latter objection led the Respondent to submit an auxiliary set of claims, wherein Claim 1 was directed to a continuous method of polymerisation and copolymerisation of ethylene at pressures "de 500 jusqu'à 3000 bars".

VIII. The Appellant requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent requested that the appeal be dismissed and that the patent be maintained as granted, or, by way of auxiliary request, that the patent be maintained on the basis of Claims 1 to 5 filed during oral proceedings.

### Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is admissible.
  
2. As it appears from the issues raised during oral proceedings (see point VII above), the Appellant relied partly on the late-filed documents (4) and (6) to support objections of lack of novelty on the basis of a line of argumentation not followed before. In view of those new approaches, the Board, using its discretionary power, has decided to admit these two citations into the appeal procedure (Article 114(2) EPC).

As far as document (5) is concerned, it relates to a process for treating the effluent from a polymerisation zone for the purification of solid polymer produced therein (column 1, lines 8 to 10). More specifically, it discloses a mass polymerisation process for the polymerisation of olefinic hydrocarbon monomers, wherein two separate streams - a stream of slurry of solid polymer and a stream of liquid effluent - are removed from the reaction zone and fed into a purification zone, wherein they are contacted with a chelating agent and a scavenger (column 1, line 55 to column 2, line 19). These two compounds, which are introduced by the separate lines 19 and 21, are thus added to the purification zone in order to carry out the purification of the solid polymer. The fact that this addition occurs at a same point situated after the reactor (drawing sheet), as the Appellant put forward (Statement of Grounds of Appeal, page 8, first paragraph), is thus of little importance in the context of the process according to the patent in suit, wherein the deactivator is injected into the reaction mixture. The Appellant having conceded that major difference during oral proceedings, the Board decided to disregard that



citation, which consequently will not be considered hereinafter.

3. The current wording of the claims according to both requests does not give rise to any objections under Article 123 EPC.

The set of Claims 1 to 5 according to the main request not having been amended, the only amendment to consider is the introduction of a lower limit of 500 bars in Claim 1 according to the auxiliary request, whereby a range of pressure of from 500 up to 3000 bars to carry out the method of polymerisation is defined. Although such a range is not explicitly disclosed in the patent specification in connection with the process claimed at present, the value of 500 bars is mentioned in the description as the limit generally accepted in the art, above which a process is classified as a high pressure process (page 2, lines 3 to 6). Moreover, reference is made in the description of the patent in suit to the process described in document (3) and to pressures higher than 500 bars used therein (page 2, lines 29 to 33). In summary, in the Board's view, the skilled man would readily associate a lower limit of 500 bars with the concept of high pressure process of polymerisation and copolymerisation of ethylene; this was not disputed by the Appellant.

For these reasons, therefore, the claims according to the auxiliary request are regarded as adequately supported by the original disclosure.

4. During oral proceedings, the Appellant had argued on the basis of the late filed document (6) and a new interpretation of document (1) that the claimed subject-matter was no longer novel.

4.1 Document (6) describes a process for destroying the polymerisation catalyst by means of a finely divided solid product which is brought into contact with the polymer, especially a polyolefin such as polyethylene, maintained in solution in a solvent in which that solid product is completely insoluble (page 1, paragraph bridging columns 1 and 2). The latter, which must contain water physically or chemically bound, i.e. absorbed water, crystallisation water or compositional water, can be chosen among hydroxides, phosphates or polyphosphates of alkali and alkaline earth metals, sodium aluminate as well as several types of zeolithes, which all have the further advantage to neutralise hydrogen chloride formed during the destruction of the catalyst (page 1, column 2, paragraphs 2 and 3; page 2, column 1, paragraph 2).

Although it is additionally specified that this treatment is carried out at a temperature higher than 100°C, preferably between 120 and 150°C (page 2, column 1, paragraph 3) and that the catalyst generally comprises a titanium tri- or tetrahalogenide and an alkyl aluminium compound (Examples 1 and 4 to 7), this teaching cannot be regarded as novelty destroying, for the main purpose of that treatment is to fix the catalyst decomposition products to the grains of the solid material, the latter being subsequently removed from the solution of the polymer by filtration in order to obtain a pure polymer solution (paragraph bridging pages 1 and 2). The solvent is then separated from the polymer by a conventional method, whereby a product of high purity is obtained (page 2, column 2, paragraph 2), as evident from the ash content mentioned in the examples.

By contrast to the process according to the patent in suit, which is based on the retention of the catalyst deactivation products within the polymer, the process

according to document (6) aims thus at the complete elimination of those products. Novelty of the claimed subject-matter can thus be acknowledged on the basis of at least that essential difference.

- 4.2 Arguing that final stabilisation could not be dissociated from the polymerisation reaction, but, on the contrary, should be regarded as part of the actual preparation of the polymer, the Appellant had further concluded that the disclosure of document (1), which is directed to the use of DHT-4A as a stabiliser acting as a halogen scavenger in plastic processes, such as in the production of polyolefins (Introduction), was novelty destroying. For that purpose, the Appellant relied, in the first place, on the interpretation of document (1) in the light of the teaching of document (4), and, in the second place, on the assumption that DHT-4A in document (1), like the inorganic anion-exchange substance in the patent in suit, was added to a polymer in the molten state. That chain of arguments cannot be accepted for several reasons.

The first one is that document (1) is not specifically concerned with polyethylene, but with polyolefins in general, and polypropylene in particular (page 1, column 1, Advantages of DHT-4A, first paragraph; page 2, column 1, Recommended Ratio of Additive to Mix). The second one is that document (1) does not refer to document (4) at all, whose teaching consequently cannot be incorporated by reference; there is thus no reason to interpret the teaching of the former in the light of the disclosure of the latter. But even if, for the sake of argumentation, one regarded, on the one hand, stabilisation of polyethylene as disclosed in document (1), and, on the other hand, the content of document (4) as common general knowledge, the information made available would at most suggest a process for the

polymerisation of ethylene, wherein the residues of solvent and catalyst used during the polymerisation reaction have to be removed (cf. document (4), point 2.2.3.4), which is exactly the opposite of the method chosen in the patent in suit. The fact that the polymer might be in the molten state when DHT-4A is incorporated therein would thus be irrelevant for the issue of novelty. For that reason, the combined teaching considered by the Appellant cannot anticipate the claimed subject-matter.

4.3 From the foregoing it follows that the requirement of novelty under Article 54 EPC is met.

5. The patent in suit concerns a process for the polymerisation and the copolymerisation of ethylene at high pressure and temperature in the presence of Ziegler-type catalysts. This is readily apparent not only from the title thereof ("Procédé ... à pressions élevées ..."), but as well from the reference to high pressure polymerisation processes in the introductory section of the description (page 2, lines 3 to 6) and, further, from the mention of document (3) as starting point of the invention (page 2, lines 29 to 34). That citation, which the Board, like the Opposition Division, regards as the closest state of the art, describes a process of preparation of polyethylene, wherein the polymerisation is carried out at pressures higher than 500 bars and at temperatures higher than 160°C in the presence of a catalyst system comprising a transition metal derivative and an alkyl aluminium compound (Claim 1). Under such reaction conditions, these so-called Ziegler catalysts exhibit optimal efficiency. In order to prevent side reactions likely to occur in the separators, at least one compound selected among the carboxylic acid alkali and alkaline earth metal salts is injected into the reaction mixture towards the end of reaction in an amount sufficient to ensure deactivation of

the catalyst; additionally, that carboxylic acid metal salt must be such that the titanium and aluminium derivatives which are formed by reaction with the catalyst are basically inert and may consequently remain within the polymer (page 2, lines 7 to 21). Although such process presents substantial advantages over previous methods, which were based on elimination of the catalysts from the polymer by solubilisation of their reaction products (page 1, lines 27 to 34), it suffers from several shortcomings. In the first place, the deactivation of the catalyst still cannot be regarded as entirely satisfactory; in the second place, the deactivator generates corrosive compounds as the result of neutralisation of hydrochloric acid formed as well as by thermal decomposition of the metal salts themselves.

In the light of this prior art teaching the technical problem underlying the patent in suit can thus be seen in providing a high efficiency high pressure polymerisation process for the polymerisation of ethylene, wherein the deactivation of the catalyst is improved and no corrosive compounds are generated.

6. According to the patent in suit - both main request and auxiliary request - this problem is proposed to be solved by injecting into the reaction mixture as deactivator at least one inorganic anion-exchange substance chosen from the natural or synthetic carbonates, phosphates, hydroxides and chlorides of aluminium and of an alkali or alkaline earth metal.

As correctly stated by the Appellant during oral proceedings, in the absence of a lower pressure limit, Claim 1 according to the main request encompasses low pressure polymerisation processes as well; although deactivation of the catalyst it more effective in the case

of Example 1 with an inorganic anion-exchange substance according to the patent in suit than in the case of Comparative Example 1 with calcium stearate according to document (3), as evident from the amount of ethylene reacted after deactivation of the catalyst, the catalyst efficiency is so poor that the overall process is of no commercial interest. Hence, the above-defined problem of providing a high-efficiency process is not in fact solved.

This becomes abundantly clear in view of what follows: in fact, in the Board's view, the comparison made with regard to the lower pressure range covered by the claim of the main request is not appropriate: as noted above in point 5, document (3) concerns a process for the preparation of polyethylene, wherein the polymerisation reaction is carried out at pressures higher than 500 bars and at temperatures higher than 160°C; the choice of calcium stearate as catalyst deactivator has to be considered in the framework of such a process, i.e. in accordance with these operative conditions involving high catalyst efficiency. By contrast, there is used in Comparative Example 1 the same deactivator as in document (3), but in a process carried out at a pressure of about one atmosphere. As appears from the discussion of document (6) in point 4.1 above and of document (4) in points 7.2.2 and 7.2.3, hereinafter, purification of polyethylene prepared by such low pressure polymerisation process is achieved with compounds, which (i) are used in large amounts, since the catalysts themselves are used in relatively great quantities as the result of their low efficiency, and (ii) are eliminated after the purification treatment. These are significant differences with regard to the working conditions described in document (3). It follows that Comparative Example 1 does not correspond to a specific embodiment, i.e. to a combination of features

peculiar to the low pressure polymerisation process, but to a "hybrid" combination of features, which cannot be regarded as an adequate basis for the purpose of comparison.

By contrast, the experimental data in Example 2 of the patent in suit, which is carried out at a pressure of 1200 bar, demonstrate that the three requirements specified in the definition of the above technical problem - improved deactivation of the catalyst, absence of corrosive compounds and high catalyst efficiency - are all met. This result was not disputed by the Appellant. It follows that the combination of features according to Claim 1 of the auxiliary request provides an effective solution to the above-defined technical problem.

7. It still remains to be examined whether the subject-matter of the patent in suit as defined in Claim 1 involves an inventive step with regard to the teaching of the documents relied upon by the Appellant.

#### 7.1 Main request

As shown in point 6 above, the subject-matter of the main request does not in fact solve the existing problem (cf. point 5, last paragraph). All that the proposal of the main request does provide is a mere alternative process in which, in place of the stearates of document (3), there are used as catalyst deactivators the anion exchange compounds defined in Claim 1 of the patent in suit. At lower pressures the resulting process is less efficient than that of document (3). The fact per se that the said compounds would function as such deactivators was evident to the skilled person on the basis of his general technical knowledge. Thus the existence of the said

alternative process was obvious, and the subject-matter of the main request does not involve an inventive step.

## 7.2 Auxiliary request

7.2.1 As noted above when dealing with document (1), DHT-4A is described there as a stabiliser for the further processing of polyolefins, which can only mean that it is added to the final product after completion of the polymerisation reaction. In that respect, the passage on page 2, column 1, Recommended Ratio of Additive to Mix, wherein it is stated that

"0.05 to 0.3 parts by weight of DHT-4A are required together with other additives to 100 parts by weight of dry polypropylene powder. The mixture is then kneaded, and pelletised by an extruder",

does not allow any other interpretation.

Nor do the various properties of DHT-4A, which are mentioned in that citation (page 1, columns 1 and 2, Advantages of DHT-4A), namely

- (i) no corrosion in molding equipment or degradation of the polymers themselves,
- (ii) reduced loss of the polymer physical properties resulting from additives,
- (iii) no problem of polymer yellowing when DHT-4A contacts with phenolic type stabilisers,
- (iv) elimination of problems related to acid vapors, and



- (v) substantial reduction of water carry-over with regard to conventional additives,

suggest any improved ability to deactivate high-efficiency Ziegler catalysts used in ethylene polymerisation processes.

Further, in the Board's view, the mechanism of acid-absorption of DHT-4A by anion-exchange described in document (1) (page 1, column 2, Characteristics of DHT-4A) would rather deter the skilled man from adding that compound for such deactivating purposes in high-efficiency processes. In the case of hydrochloric acid, the carbonate ion is easily ion-exchanged by a chlorine ion, whereby, on the one hand, the latter is adsorbed and fixed in a stable crystal structure, and, on the other hand, carbon dioxide and water are released. The Appellant's argument that this information by itself would be an incentive to use DHT-4A as a deactivator, since carbon dioxide and water are both well known catalyst poisons, cannot be accepted, for a catalyst deactivator cannot be equated with a catalyst poison. As argued by the Respondent in the Counter-statement of Appeal (page 5, paragraph 3 and page 6, paragraph 1), the difference lies not so much in their effect on the catalyst activity than in the fact that a catalyst poison is generally an unwanted substance which may occur for various causes, whereas a deactivator is deliberately introduced by the operator under conditions and on the basis of criteria freely chosen in order to keep full control of the process. In the present case, in addition to the requirement in terms of mere catalyst deactivation, the compound injected into the reaction mixture should fulfil several conditions, such as optimal activity at the injecting point, ease of injection at high pressure into the polymerisation mass, homogeneous dispersibility in that reaction medium, as well as low

tendency to promote isomerisation or hydrogenation reactions; but, above all, that compound should not generate products that would recycle with the monomers to the polymerisation reactor (compare patent in suit, page 2, lines 49 to 51). That last condition would rather speak against the use of DHT-4A, since the catalyst poisons formed from DHT-4A would be involved as gaseous compounds in the monomer recycling process, thus expected to impair the efficiency of the process.

For these various reasons, the teaching of document (1) cannot lead the skilled man to the solution within the terms of the patent in suit in accordance with the auxiliary request.

- 7.2.2 It has been concluded in point 4.1 above that, although the features of the process disclosed in document (6) bear a superficial similarity to those of the claimed subject-matter, the fact that the catalyst residues have to be eliminated represents by itself a difference on which novelty could be acknowledged. In the Board's view, that fundamental difference alone makes the teaching of this citation irrelevant for the solution of the above-defined technical problem.

Additionally, it has to be appreciated that document (6) is concerned with a process carried out at rather low pressures in the presence, as catalysts, of organometallic compounds, optionally together with metal halogenides (page 1, column 1, paragraphs 1 and 2; examples; résumé). Such features, in connection with the date of publication of the citation (26 January 1960), obviously relate to an obsolete process involving the use of catalysts of the so-called first generation; in view of their low activity, they have to be used in large amounts, resulting in reduced stability and tendency to colouration

of the polymer, as well as release of substantial amounts of acids. For this reason, the purification step, i.e. the removal of the catalyst residues, must be regarded as an essential feature of that prior art process. The fact that according to Claim 4 and the examples the duration of that treatment is between a quarter of an hour and an hour, and that, by contrast, the deactivation of the catalyst in the patent in suit is completed within a few seconds, is further evidence that the two processes have little in common. The mere fact that several compounds quoted in document (6) correspond to the inorganic anion-exchange substances specified in Claim 1 of the patent in suit does not alter this conclusion.

It follows that document (6) cannot provide any information useful to overcome the difficulties resulting from the interactions between monomers and catalyst residues, nor, thereby, contribute to the solution of the above-defined technical problem.

- 7.2.3 Similar considerations apply to document (4), since from the introductory paragraph 2.2.3.4 "Aufarbeitung des Polymerisats" it clearly appears that the whole document deals with the processing of the polymer, i.e. the further treatment, especially the purification of the final polymer after the polymerisation stage, in order to remove residues of solvents and catalyst. The removal of those catalyst residues is regarded as an essential step and three different methods are indicated for that purpose (page 80, paragraphs 3 and 4).

Further, like in the case of document (6) and for the same reason (date of publication: 1969), the catalysts referred to belong to the so-called first generation of Ziegler catalysts, of which large amounts have to be used; in order to avoid colouration, oxidation of oligomer

fractions, as well as detrimental influence on the dielectric properties, it is essential to remove these catalyst residues after completion of the polymerisation reaction (page 80, paragraph 1). It is self-evident that the techniques recommended for that purpose in document (4) cannot be transposed to the context of polymerisation processes, wherein high activity catalysts as well as high pressures and temperatures are involved.

For both reasons, nothing can be deduced from document (4) with respect to the problem underlying the patent in suit.

- 7.2.4 In view of the foregoing, the combination of features according to Claim 1 of the auxiliary request cannot be regarded as obvious with respect to the prior art cited and involves thus an inventive step.
8. Nor can the Board accept the objection of insufficient disclosure raised by the Appellant.

First, as far as the general features of the process are concerned, the skilled man could rely on the basic information provided by document (3) regarding the injecting point (page 3, lines 18 to 27; Claims 3 and 4) and the form in which the deactivator should be injected (page 4, lines 10 to 12). The fact that in the process according to the patent in suit other compounds are injected does not affect the validity of this teaching.

Secondly, as far as the specific features of DHT-4A are concerned, there can be no doubt, in the Board's view, that the skilled man would know how to determine the most appropriate particle size in order to optimise the contact between the deactivator and the reaction mass, as well as to avoid abrasion problems that could affect the injection

pumps. The necessary experiments would not require more than routine tests based on the method of trial and error. As noted by the Board in the decision T 14/83 "Vinylchloride resins" published in OJ EPO, 1984, 105, occasional lack of success of a claimed process does not impair its feasibility in the sense of Article 83 EPC if, for example, some experimentation is still to be done to transform the failure into success, provided that such experimentation is not an undue burden and does not require inventive activity (point 6, paragraph 1).

It can thus be concluded that the description of the patent in suit provides all the information enabling the skilled man to carry out the claimed process.

9. Claim 1 being allowable, the same applies to dependent Claims 2 to 5, which are directed to preferred embodiments of the subject-matter of Claim 1 and whose inventiveness is supported by that of the main claim.

**Order**

**For these reasons, it is decided that:**

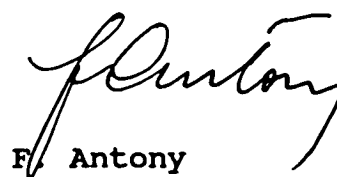
1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of Claims 1 to 5 submitted during oral proceedings and the description yet to be adapted.

The Registrar:



E. Görgmaier

The Chairman:



F. Antony